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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/768,083	01/23/2001	Lan Zhang	M-9699 US	1431

7590 11/30/2004

DAVID L. McCOMBS
HAYNES & BOONE, LLP
901 MAIN STREET
SUITE 3100
DALLAS, TX 75202-3789

EXAMINER	
THANGAVELU, KANDASAMY	
ART UNIT	**PAPER NUMBER**
2123	

DATE MAILED: 11/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/768,083	Applicant(s) ZHANG ET AL.	
	Examiner Kandasamy Thangavelu	Art Unit 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3,5-8,10,11 and 16-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,5-8,10,11 and 16-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This communication is in response to the Applicants' Response mailed on August 17, 2004. Claims 1, 6, 10, 16, 18 and 20 were amended. Claims 2, 4, 9 and 12-15 were cancelled. Claims 1, 3, 5-8, 10, 11 and 16-20 of the application are pending. This office action is made final.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 16-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 16 and 18 deal with a computer system, comprising a central processing unit and a heat sink coupled to the central processing unit. The claim limitations deal with the heat sink having fins and bars, the number of fins and the number of bars of the heat sink determined by:

determining the distance of a central processing unit from a heat sink;

determining a number of fins and a number of bars of the heat sink; ...

The claim is thus circular because the number of fins and the number of bars of the heat sink are determined by .... determining a number of fins and a number of bars of the heat sink, thus making the claim indefinite.

Claim 20 deals with heat sink for a computer system, the heat sink coupled to the central processing unit. The claim limitations deal with the heat sink having fins and bars, the number of fins and the number of bars of the heat sink determined by:

determining the distance of a central processing unit from a heat sink;

determining a number of fins and a number of bars of the heat sink; ...

The claim is thus circular because the number of fins and the number of bars of the heat sink are determined by .... determining a number of fins and a number of bars of the heat sink, thus making the claim indefinite.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

5. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1, 3 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Namiki** (U.S. Patent Application 2002/0099510) in view of **Treiber et al.** (U.S. Patent 6,664,463), and further in view of **Visser et al.** ("Minimization of heat sink mass using Mathematical optimisation", IEEE 2000), **Remsburg et al.** (U.S. Patent 5,804,875), **Houghton et al.** (U.S. Patent 6,282,095) and **Fleischhauer et al.** (U.S. Patent 5,591,368).

6.1 As per claim 1, **Namiki** teaches Electromagnetic wave analyzer and computer-readable medium storing programs for electromagnetic wave analysis. **Namiki** teaches method for calculating electromagnetic radiation in a computer system (Page 1, Para 0002); comprising:

modeling characteristic radiation from the central processing unit as a modulated Gaussian pulse (Page 7, Para 0081); and

estimating the electromagnetic field produced by the central processing unit using finite differences in time domain (FDTD) to solve Maxwell's equation (Page 1, Para 0002 and Para 0004; Page 2, Para 0030; Page 3, Para 0044).

Namiki teaches determining the distance of the point where the electromagnetic filed is estimated from the source of the field (Page 1, Para 0004 and 0005). **Namiki** does not expressly teach determining the distance of a central processing unit from a heat sink. **Treiber et al.** teaches determining the distance of a central processing unit from a heat sink (Abstract, L1-9; CL1, L7-13; CL1, L45-47), because the heat sink forms part of the assembly for shielding the electromagnetic radiations generated by the electronic component such as the central processing unit (CL2, L9-14); and the shielding performance depends upon the distance of the central processing unit (source of the radiation) to the heat sink (shield) (CL1, L45-47). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to combine the method of **Namiki** involving determining the distance of the point where the electromagnetic filed is estimated from the source of the field with the method of **Treiber et al.** that included determining the distance of a central processing unit from a heat sink. One would be motivated because the heat sink would form part of the assembly for shielding the electromagnetic radiations generated by the electronic component such as the central processing unit; and the shielding performance would depend upon the distance of the central processing unit (source of the radiation) to the heat sink (shield).

Namiki does not expressly teach determining a number of fins of the heat sink. **Visser et al.** teaches determining a number of fins of the heat sink (Page 253, CL2, Para 2; Page 256, CL1, Para 2; Page 256, CL2, Para 2), because the performance of the heat sink depends on a number of parameters (Page 253, CL1, Para 2); heat sinks often take much space and contribute to the weight and cost of the product (Page 253, CL1, Para 1); and the minimization heat sink mass or thermal resistance requires properly selecting the fin height, fin thickness, the extrusion length,

the base thickness and the number of fins (Page 253, CL2, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Visser et al.** that included determining a number of fin of the heat sink. One would be motivated because the performance of the heat sink would depend on a number of parameters; heat sinks often would take much space and would contribute to the weight and cost of the product; and the minimization heat sink mass or thermal resistance would require properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins.

Namiki does not expressly teach determining a number of bars of the heat sink. **Treiber et al.** teaches determining a number of bars of the heat sink (CL1, L37-42; CL1, L64 to CL2, L17; CL5, L66 to CL6, L5; CL7, L56-62), because the bars (conductor) provide electrical contact between the heat sink and the and the surface of the conductive enclosures in which the electronic component such as the processor is mounted, thus shielding the electromagnetic radiation generated by the electronic component (CL2, L9-17); the bars (conductors) can be provided between the heat sink and the processor to facilitate improved heat transfer between them (CL5, L13-15); it is inherent that the shielding provided to the electromagnetic radiation and the heat transfer are proportional to the number of bars and their size. It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Treiber et al.** that included determining a number of bars of the heat sink. One would be motivated because the bars (conductor) would provide electrical contact between the heat sink and the and the surface of the conductive enclosures in which the electronic component such as the processor was mounted, thus shielding the electromagnetic

radiation generated by the electronic component; the bars (conductors) could be provided between the heat sink and the processor to facilitate improved heat transfer between them; and the shielding provided to the electromagnetic radiation and the heat transfer are would be proportional to the number of bars and their size

Namiki does not expressly teach determining the heat sink fin geometry. **Visser et al.** teaches determining the heat sink fin geometry (Page 253, CL2, Para 2; Page 256, CL1, Para 2; Page 256, CL2, Para 2), because the performance of the heat sink depends on a number of parameters (Page 253, CL1, Para 2); heat sinks often take much space and contribute to the weight and cost of the product (Page 253, CL1, Para 1); and the minimization heat sink mass or thermal resistance requires properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins (Page 253, CL2, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Visser et al.** that included determining the heat sink fin geometry. One would be motivated because the performance of the heat sink would depend on a number of parameters; heat sinks often would take much space and would contribute to the weight and cost of the product; and the minimization heat sink mass or thermal resistance would require properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins.

Namiki does not expressly teach determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size. **Remsburg et al.** teaches determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size (CL1, L49-50; CL4, L11-13), because through such capacitive

coupling the heat sink acts as an antenna for EMI radiation, thereby amplifying the effects of the radiation (CL1, L50-52). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Remsburg et al.** that included determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size. One would be motivated because through such capacitive coupling the heat sink would act as an antenna for EMI radiation, thereby amplifying the effects of the radiation.

Namiki does not expressly teach determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars. **Houghton et al.** teaches determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars (CL2, L44-50), because inductive coupling causes RF voltage between the heat sink and the IC (CL2, 44-45); and such unintended voltage change may be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device (CL1, L40-43). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Houghton et al.** that included determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars. One would be motivated because inductive coupling would cause RF voltage between the heat sink and the IC; and such unintended voltage change might be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device.

Namiki does not expressly teach determining the current density across the heat sink for adjusting the fin geometry. **Fleischhauer et al.** teaches determining the current density across the heat sink for adjusting the fin geometry (CL14, L50-67), because one can increase the thickness of the material of the current path resulting in lower the current density and the ohmic heating (CL14, 60-63); and add an additional heat sink material such as fins to increase the thermal transfer (CL14, L65-67). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Fleischhauer et al.** that included determining the current density across the heat sink for adjusting the fin geometry. One would be motivated because one could increase the thickness of the material of the current path resulting in lower the current density and the ohmic heating; and add an additional heat sink material such as fins to increase the thermal transfer.

6.2 As per claim 3, **Namik, Treiber et al., Visser et al., Remsburg et al., Houghton et al.** and **Fleischhauer et al.** teach the method of claim 1. **Namiki** does not expressly teach reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit. **Remsburg et al.** teaches reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit (CL1, L54-61; CL2, L34-37; CL4, L13-18), because as per **Treiber et al.** electromagnetic radiation can adversely affect circuit performance and threaten circuits in nearby equipment (CL1, L23-27). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Remsburg et al.** that included reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit. One would be

motivated because electromagnetic radiation could adversely affect circuit performance and threaten circuits in nearby equipment.

6.3 As per claim 5, **Namik, Treiber et al., Visser et al., Remsburg et al., Houghton et al.** and **Fleischhauer et al.** teach the method of claim 1. **Namiki** does not expressly teach reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit. **Houghton et al.** teaches reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit (CL2, L61-64; CL4, L1-12), because inductive coupling causes RF voltage between the heat sink and the IC (CL2, 44-45); and such unintended voltage change may be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device (CL1, L40-43). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Houghton et al.** that included reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit. One would be motivated because inductive coupling would cause RF voltage between the heat sink and the IC; and such unintended voltage change might be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device.

6.4 As per claim 10, **Namiki** teaches modeling characteristic radiation from the central processing unit as a modulated Gaussian pulse (Page 7, Para 0081); and

estimating the electromagnetic field produced by the central processing unit using finite differences in time domain (FDTD) to solve Maxwell's equation (Page 1, Para 0002 and Para 0004; Page 2, Para 0030; Page 3, Para 0044).

Namiki teaches determining the distance of the point where the electromagnetic filed is estimated from the source of the field (Page 1, Para 0004 and 0005). **Namiki** does not expressly teach a method of manufacturing a computer system, comprising determining the distance of a central processing unit from a heat sink. **Treiber et al.** teaches a method of manufacturing a computer system, comprising determining the distance of a central processing unit from a heat sink (Abstract, L1-9; CL1, L7-13; CL1, L45-47), because the heat sink forms part of the assembly for shielding the electromagnetic radiations generated by the electronic component such as the central processing unit (CL2, L9-14); and the shielding performance depends upon the distance of the central processing unit (source of the radiation) to the heat sink (shield) (CL1, L45-47). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to combine the method of **Namiki** involving determining the distance of the point where the electromagnetic filed is estimated from the source of the field with the method of **Treiber et al.** that included a method of manufacturing a computer system, comprising determining the distance of a central processing unit from a heat sink. One would be motivated because the heat sink would form part of the assembly for shielding the electromagnetic radiations generated by the electronic component such as the central processing unit; and the shielding performance would depend upon the distance of the central processing unit (source of the radiation) to the heat sink (shield).

Namiki does not expressly teach determining a number of fins of the heat sink. **Visser et al.** teaches determining a number of fins of the heat sink (Page 253, CL2, Para 2; Page 256, CL1, Para 2; Page 256, CL2, Para 2), because the performance of the heat sink depends on a number of parameters (Page 253, CL1, Para 2); heat sinks often take much space and contribute to the weight and cost of the product (Page 253, CL1, Para 1); and the minimization heat sink mass or thermal resistance requires properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins (Page 253, CL2, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Visser et al.** that included determining a number of fin of the heat sink. One would be motivated because the performance of the heat sink would depend on a number of parameters; heat sinks often would take much space and would contribute to the weight and cost of the product; and the minimization heat sink mass or thermal resistance would require properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins.

Namiki does not expressly teach determining a number of bars of the heat sink. **Treiber et al.** teaches determining a number of bars of the heat sink (CL1, L37-42; CL1, L64 to CL2, L17; CL5, L66 to CL6, L5; CL7, L56-62), because the bars (conductor) provide electrical contact between the heat sink and the and the surface of the conductive enclosures in which the electronic component such as the processor is mounted, thus shielding the electromagnetic radiation generated by the electronic component (CL2, L9-17); the bars (conductors) can be provided between the heat sink and the processor to facilitate improved heat transfer between them (CL5, L13-15); it is inherent that the shielding provided to the electromagnetic radiation

and the heat transfer are proportional to the number of bars and their size. It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Treiber et al.** that included determining a number of bars of the heat sink. One would be motivated because the bars (conductor) would provide electrical contact between the heat sink and the and the surface of the conductive enclosures in which the electronic component such as the processor was mounted, thus shielding the electromagnetic radiation generated by the electronic component; the bars (conductors) could be provided between the heat sink and the processor to facilitate improved heat transfer between them; and the shielding provided to the electromagnetic radiation and the heat transfer are would be proportional to the number of bars and their size

Namiki does not expressly teach determining the heat sink fin geometry. **Visser et al.** teaches determining the heat sink fin geometry (Page 253, CL2, Para 2; Page 256, CL1, Para 2; Page 256, CL2, Para 2), because the performance of the heat sink depends on a number of parameters (Page 253, CL1, Para 2); heat sinks often take much space and contribute to the weight and cost of the product (Page 253, CL1, Para 1); and the minimization heat sink mass or thermal resistance requires properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins (Page 253, CL2, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Visser et al.** that included determining the heat sink fin geometry. One would be motivated because the performance of the heat sink would depend on a number of parameters; heat sinks often would take much space and would contribute to the weight and cost of the product; and the minimization heat sink mass or thermal resistance would require properly

selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins.

Namiki does not expressly teach determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size. **Remsburg et al.** teaches determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size (CL1, L49-50; CL4, L11-13), because through such capacitive coupling the heat sink acts as an antenna for EMI radiation, thereby amplifying the effects of the radiation (CL1, L50-52). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Remsburg et al.** that included determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size. One would be motivated because through such capacitive coupling the heat sink would act as an antenna for EMI radiation, thereby amplifying the effects of the radiation.

Namiki does not expressly teach determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars. **Houghton et al.** teaches determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars (CL2, L44-50), because inductive coupling causes RF voltage between the heat sink and the IC (CL2, 44-45); and such unintended voltage change may be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device (CL1, L40-43). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Houghton et al.** that included determining if inductive

coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars. One would be motivated because inductive coupling would cause RF voltage between the heat sink and the IC; and such unintended voltage change might be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device.

Namiki does not expressly teach determining the current density across the heat sink for adjusting the fin geometry. **Fleischhauer et al.** teaches determining the current density across the heat sink for adjusting the fin geometry (CL14, L50-67), because one can increase the thickness of the material of the current path resulting in lower the current density and the ohmic heating (CL14, 60-63); and add an additional heat sink material such as fins to increase the thermal transfer (CL14, L65-67). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Fleischhauer et al.** that included determining the current density across the heat sink for adjusting the fin geometry. One would be motivated because one could increase the thickness of the material of the current path resulting in lower the current density and the ohmic heating; and add an additional heat sink material such as fins to increase the thermal transfer.

Namiki does not expressly teach reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit. **Remsburg et al.** teaches reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit (CL1, L54-61; CL2, L34-37; CL4, L13-18), because as per **Treiber et al.** electromagnetic radiation can adversely affect circuit performance and threaten circuits in nearby equipment (CL1, L23-27). It would have been obvious to one of ordinary skill in the art at the

time of Applicants' invention to modify the method of **Namiki** with the method of **Remsburg et al.** that included reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit. One would be motivated because electromagnetic radiation could adversely affect circuit performance and threaten circuits in nearby equipment.

Namiki does not expressly teach reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit. **Houghton et al.** teaches reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit (CL2, L61-64; CL4, L1-12), because inductive coupling causes RF voltage between the heat sink and the IC (CL2, 44-45); and such unintended voltage change may be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device (CL1, L40-43). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Houghton et al.** that included reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit. One would be motivated because inductive coupling would cause RF voltage between the heat sink and the IC; and such unintended voltage change might be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device.

6.5 As per claim 16, **Namiki** teaches modeling characteristic radiation from the central processing unit as a modulated Gaussian pulse (Page 7, Para 0081); and

estimating the electromagnetic field produced by the central processing unit using finite differences in time domain (FDTD) to solve Maxwell's equation (Page 1, Para 0002 and Para 0004; Page 2, Para 0030; Page 3, Para 0044).

Namiki teaches a computer system for determining the distance of the point where the electromagnetic filed is estimated from the source of the field (Page 1, Para 0004 and 0005). **Namiki** does not expressly teach a computer system, comprising a central processing unit, a heat sink coupled to the central processing unit, and determining the distance of a central processing unit from a heat sink. **Treiber et al.** teaches a computer system, comprising a central processing unit, a heat sink coupled to the central processing unit, and determining the distance of a central processing unit from a heat sink (Abstract, L1-9; CL1, L7-13; CL1, L45-47), because the heat sink forms part of the assembly for shielding the electromagnetic radiations generated by the electronic component such as the central processing unit (CL2, L9-14); and the shielding performance depends upon the distance of the central processing unit (source of the radiation) to the heat sink (shield) (CL1, L45-47). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer system of **Namiki** involving determining the distance of the point where the electromagnetic filed is estimated from the source of the field with the computer system of **Treiber et al.** that included a computer system, comprising a central processing unit, a heat sink coupled to the central processing unit, and determining the distance of a central processing unit from a heat sink. One would be motivated because the heat sink would form part of the assembly for shielding the electromagnetic radiations generated by the electronic component such as the central processing unit; and the

shielding performance would depend upon the distance of the central processing unit (source of the radiation) to the heat sink (shield).

Namiki does not expressly teach determining a number of fins of the heat sink. **Visser et al.** teaches determining a number of fins of the heat sink (Page 253, CL2, Para 2; Page 256, CL1, Para 2; Page 256, CL2, Para 2), because the performance of the heat sink depends on a number of parameters (Page 253, CL1, Para 2); heat sinks often take much space and contribute to the weight and cost of the product (Page 253, CL1, Para 1); and the minimization heat sink mass or thermal resistance requires properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins (Page 253, CL2, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer system of **Namiki** with the computer system of **Visser et al.** that included determining a number of fin of the heat sink. One would be motivated because the performance of the heat sink would depend on a number of parameters; heat sinks often would take much space and would contribute to the weight and cost of the product; and the minimization heat sink mass or thermal resistance would require properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins.

Namiki does not expressly teach determining a number of bars of the heat sink. **Treiber et al.** teaches determining a number of bars of the heat sink (CL1, L37-42; CL1, L64 to CL2, L17; CL5, L66 to CL6, L5; CL7, L56-62), because the bars (conductor) provide electrical contact between the heat sink and the and the surface of the conductive enclosures in which the electronic component such as the processor is mounted, thus shielding the electromagnetic radiation generated by the electronic component (CL2, L9-17); the bars (conductors) can be

provided between the heat sink and the processor to facilitate improved heat transfer between them (CL5, L13-15); it is inherent that the shielding provided to the electromagnetic radiation and the heat transfer are proportional to the number of bars and their size. It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer system of **Namiki** with the computer system of **Treiber et al.** that included determining a number of bars of the heat sink. One would be motivated because the bars (conductor) would provide electrical contact between the heat sink and the and the surface of the conductive enclosures in which the electronic component such as the processor was mounted, thus shielding the electromagnetic radiation generated by the electronic component; the bars (conductors) could be provided between the heat sink and the processor to facilitate improved heat transfer between them; and the shielding provided to the electromagnetic radiation and the heat transfer are would be proportional to the number of bars and their size

Namiki does not expressly teach determining the heat sink fin geometry. **Visser et al.** teaches determining the heat sink fin geometry (Page 253, CL2, Para 2; Page 256, CL1, Para 2; Page 256, CL2, Para 2), because the performance of the heat sink depends on a number of parameters (Page 253, CL1, Para 2); heat sinks often take much space and contribute to the weight and cost of the product (Page 253, CL1, Para 1); and the minimization heat sink mass or thermal resistance requires properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins (Page 253, CL2, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer system of **Namiki** with the computer system of **Visser et al.** that included determining the heat sink fin geometry. One would be motivated because the performance of the heat sink would

depend on a number of parameters; heat sinks often would take much space and would contribute to the weight and cost of the product; and the minimization heat sink mass or thermal resistance would require properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins.

Namiki does not expressly teach determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size. **Remsburg et al.** teaches determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size (CL1, L49-50; CL4, L11-13), because through such capacitive coupling the heat sink acts as an antenna for EMI radiation, thereby amplifying the effects of the radiation (CL1, L50-52). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer system of **Namiki** with the computer system of **Remsburg et al.** that included determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size. One would be motivated because through such capacitive coupling the heat sink would act as an antenna for EMI radiation, thereby amplifying the effects of the radiation.

Namiki does not expressly teach determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars. **Houghton et al.** teaches determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars (CL2, L44-50), because inductive coupling causes RF voltage between the heat sink and the IC (CL2, 44-45); and such unintended voltage change may be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device (CL1, L40-43). It would have

been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer system of **Namiki** with the computer system of **Houghton et al.** that included determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars. One would be motivated because inductive coupling would cause RF voltage between the heat sink and the IC; and such unintended voltage change might be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device.

Namiki does not expressly teach determining the current density across the heat sink for adjusting the fin geometry. **Fleischhauer et al.** teaches determining the current density across the heat sink for adjusting the fin geometry (CL14, L50-67), because one can increase the thickness of the material of the current path resulting in lower the current density and the ohmic heating (CL14, 60-63); and add an additional heat sink material such as fins to increase the thermal transfer (CL14, L65-67). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer system of **Namiki** with the computer system of **Fleischhauer et al.** that included determining the current density across the heat sink for adjusting the fin geometry. One would be motivated because one could increase the thickness of the material of the current path resulting in lower the current density and the ohmic heating; and add an additional heat sink material such as fins to increase the thermal transfer.

6.6 As per claim 17, **Namik, Treiber et al., Visser et al., Remsburg et al., Houghton et al.** and **Fleischhauer et al.** teach the computer system of claim 16. **Namiki** does not expressly teach reducing radiation noise by reducing capacitive coupling between the heat sink and the

central processing unit. **Remsburg et al.** teaches reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit (CL1, L54-61; CL2, L34-37; CL4, L13-18), because as per **Treiber et al.** electromagnetic radiation can adversely affect circuit performance and threaten circuits in nearby equipment (CL1, L23-27). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Remsburg et al.** that included reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit. One would be motivated because electromagnetic radiation could adversely affect circuit performance and threaten circuits in nearby equipment.

6.7 As per Claim 18, it is a computer system claim having all the limitations as in claim 16; in addition it has the limitation of reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit. **Namik, Treiber et al., Visser et al., Remsburg et al., Houghton et al.** and **Fleischhauer et al.** teach the computer system of claim 16.

Namiki does not expressly teach reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit. **Houghton et al.** teaches reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit (CL2, L61-64; CL4, L1-12), because inductive coupling causes RF voltage between the heat sink and the IC (CL2, 44-45); and such unintended voltage change may be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device (CL1, L40-43). It would have been obvious to one of ordinary skill in the art at the time of

Applicants' invention to modify the method of **Namiki** with the method of **Houghton et al.** that included reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit. One would be motivated because inductive coupling would cause RF voltage between the heat sink and the IC; and such unintended voltage change might be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device.

6.8 As per Claim 20, it is rejected based on the same reasoning as Claim 16, supra. Claim 20 is a heat sink for the computer system claim reciting the same limitations as Claim 16, as taught throughout by **Namik, Treiber et al., Visser et al., Remsburg et al., Houghton et al.** and **Fleischhauer et al.**

7. Claims 6-8, 11 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Namiki** (U.S. Patent Application 2002/0099510) in view of **Treiber et al.** (U.S. Patent 6,664,463), and further in view of **Visser et al.** ("Minimization of heat sink mass using Mathematical optimisation", IEEE 2000), **Remsburg et al.** (U.S. Patent 5,804,875), **Houghton et al.** (U.S. Patent 6,282,095), **Fleischhauer et al.** (U.S. Patent 5,591,368) and **Fox** (U.S. Patent Application 2002/0089449).

7.1 As per claim 6, **Namiki** teaches modeling characteristic radiation from the central processing unit as a modulated Gaussian pulse (Page 7, Para 0081); and

estimating the electromagnetic field produced by the central processing unit using finite differences in time domain (FDTD) to solve Maxwell's equation (Page 1, Para 0002 and Para 0004; Page 2, Para 0030; Page 3, Para 0044).

Namiki teaches determining the distance of the point where the electromagnetic filed is estimated from the source of the field (Page 1, Para 0004 and 0005). **Namiki** does not expressly teach determining the distance of a central processing unit from a heat sink. **Treiber et al.** teaches determining the distance of a central processing unit from a heat sink (Abstract, L1-9; CL1, L7-13; CL1, L45-47), because the heat sink forms part of the assembly for shielding the electromagnetic radiations generated by the electronic component such as the central processing unit (CL2, L9-14); and the shielding performance depends upon the distance of the central processing unit (source of the radiation) to the heat sink (shield) (CL1, L45-47). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to combine the method of **Namiki** involving determining the distance of the point where the electromagnetic filed is estimated from the source of the field with the method of **Treiber et al.** that included determining the distance of a central processing unit from a heat sink. One would be motivated because the heat sink would form part of the assembly for shielding the electromagnetic radiations generated by the electronic component such as the central processing unit; and the shielding performance would depend upon the distance of the central processing unit (source of the radiation) to the heat sink (shield).

Namiki does not expressly teach determining a number of fins of the heat sink. **Visser et al.** teaches determining a number of fins of the heat sink (Page 253, CL2, Para 2; Page 256, CL1,

Para 2; Page 256, CL2, Para 2), because the performance of the heat sink depends on a number of parameters (Page 253, CL1, Para 2); heat sinks often take much space and contribute to the weight and cost of the product (Page 253, CL1, Para 1); and the minimization heat sink mass or thermal resistance requires properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins (Page 253, CL2, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Visser et al.** that included determining a number of fin of the heat sink. One would be motivated because the performance of the heat sink would depend on a number of parameters; heat sinks often would take much space and would contribute to the weight and cost of the product; and the minimization heat sink mass or thermal resistance would require properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins.

Namiki does not expressly teach determining a number of bars of the heat sink. **Treiber et al.** teaches determining a number of bars of the heat sink (CL1, L37-42; CL1, L64 to CL2, L17; CL5, L66 to CL6, L5; CL7, L56-62), because the bars (conductor) provide electrical contact between the heat sink and the and the surface of the conductive enclosures in which the electronic component such as the processor is mounted, thus shielding the electromagnetic radiation generated by the electronic component (CL2, L9-17); the bars (conductors) can be provided between the heat sink and the processor to facilitate improved heat transfer between them (CL5, L13-15); it is inherent that the shielding provided to the electromagnetic radiation and the heat transfer are proportional to the number of bars and their size. It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the

method of **Namiki** with the method of **Treiber et al.** that included determining a number of bars of the heat sink. One would be motivated because the bars (conductor) would provide electrical contact between the heat sink and the and the surface of the conductive enclosures in which the electronic component such as the processor was mounted, thus shielding the electromagnetic radiation generated by the electronic component; the bars (conductors) could be provided between the heat sink and the processor to facilitate improved heat transfer between them; and the shielding provided to the electromagnetic radiation and the heat transfer are would be proportional to the number of bars and their size

Namiki does not expressly teach determining the heat sink fin geometry. **Visser et al.** teaches determining the heat sink fin geometry (Page 253, CL2, Para 2; Page 256, CL1, Para 2; Page 256, CL2, Para 2), because the performance of the heat sink depends on a number of parameters (Page 253, CL1, Para 2); heat sinks often take much space and contribute to the weight and cost of the product (Page 253, CL1, Para 1); and the minimization heat sink mass or thermal resistance requires properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins (Page 253, CL2, Para 2). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Visser et al.** that included determining the heat sink fin geometry. One would be motivated because the performance of the heat sink would depend on a number of parameters; heat sinks often would take much space and would contribute to the weight and cost of the product; and the minimization heat sink mass or thermal resistance would require properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins.

Namiki does not expressly teach determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size. **Remsburg et al.** teaches determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size (CL1, L49-50; CL4, L11-13), because through such capacitive coupling the heat sink acts as an antenna for EMI radiation, thereby amplifying the effects of the radiation (CL1, L50-52). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Remsburg et al.** that included determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size. One would be motivated because through such capacitive coupling the heat sink would act as an antenna for EMI radiation, thereby amplifying the effects of the radiation.

Namiki does not expressly teach determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars. **Houghton et al.** teaches determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars (CL2, L44-50), because inductive coupling causes RF voltage between the heat sink and the IC (CL2, 44-45); and such unintended voltage change may be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device (CL1, L40-43). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Houghton et al.** that included determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars. One would be motivated because inductive coupling would cause RF

voltage between the heat sink and the IC; and such unintended voltage change might be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device.

Namiki does not expressly teach determining the current density across the heat sink for adjusting the fin geometry. **Fleischhauer et al.** teaches determining the current density across the heat sink for adjusting the fin geometry (CL14, L50-67), because one can increase the thickness of the material of the current path resulting in lower the current density and the ohmic heating (CL14, 60-63); and add an additional heat sink material such as fins to increase the thermal transfer (CL14, L65-67). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Fleischhauer et al.** that included determining the current density across the heat sink for adjusting the fin geometry. One would be motivated because one could increase the thickness of the material of the current path resulting in lower the current density and the ohmic heating; and add an additional heat sink material such as fins to increase the thermal transfer.

Namiki does not expressly teach using a fast Fourier transform to translate time domain data to frequency domain. **Fox** teaches using a fast Fourier transform to translate time domain data to frequency domain (Page 1, Para 0009; Page 2, Para 0016), because Fourier transform transforms the amplitude as a function of time to amplitude as a function of frequency; to determine the response of a system to complex input signal, the input signal may be broken into sinusoidal elements and the system response to each sinusoidal elements may be analyzed (Page 1, Para 0011); and fast Fourier transform performs Fourier transformation on digitized signal over a predetermined sampling period (Page 2, Para 0016). It would have been obvious to one of

ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Fox** that included using a fast Fourier transform to translate time domain data to frequency domain. One would be motivated because Fourier transform would transform the amplitude as a function of time to amplitude as a function of frequency; to determine the response of a system to complex input signal, the input signal might be broken into sinusoidal elements and the system response to each sinusoidal elements might be analyzed; and fast Fourier transform would perform Fourier transformation on digitized signal over a predetermined sampling period.

7.2 As per claim 7, **Namik, Treiber et al., Visser et al., Remsburg et al., Houghton et al., Fleischhauer et al.** and **Fox** teach the method of claim 6. **Namiki** does not expressly teach reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit. **Remsburg et al.** teaches reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit (CL1, L54-61; CL2, L34-37; CL4, L13-18), because as per **Treiber et al.** electromagnetic radiation can adversely affect circuit performance and threaten circuits in nearby equipment (CL1, L23-27). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Remsburg et al.** that included reducing radiation noise by reducing capacitive coupling between the heat sink and the central processing unit. One would be motivated because electromagnetic radiation could adversely affect circuit performance and threaten circuits in nearby equipment.

7.3 As per claim 8, **Namik, Treiber et al., Visser et al., Remsburg et al., Houghton et al., Fleischhauer et al.** and **Fox** teach the method of claim 6. **Namiki** does not expressly teach reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit. **Houghton et al.** teaches reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit (CL2, L61-64; CL4, L1-12), because inductive coupling causes RF voltage between the heat sink and the IC (CL2, 44-45); and such unintended voltage change may be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device (CL1, L40-43). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Houghton et al.** that included reducing radiation noise by reducing inductive coupling between the heat sink and the central processing unit. One would be motivated because inductive coupling would cause RF voltage between the heat sink and the IC; and such unintended voltage change might be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device.

7.4 As per claim 11, **Namik, Treiber et al., Visser et al., Remsburg et al., Houghton et al.** and **Fleischhauer et al.** teach the method of claim 10. **Namiki** does not expressly teach using a fast Fourier transform to translate time domain data to frequency domain. **Fox** teaches using a fast Fourier transform to translate time domain data to frequency domain (Page 1, Para 0009; Page 2, Para 0016), because Fourier transform transforms the amplitude as a function of time to amplitude as a function of frequency; to determine the response of a system to complex input signal, the input signal may be broken into sinusoidal elements and the system response to each

sinusoidal elements may be analyzed (Page 1, Para 0011); and fast Fourier transform performs Fourier transformation on digitized signal over a predetermined sampling period (Page 2, Para 0016). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the method of **Namiki** with the method of **Fox** that included using a fast Fourier transform to translate time domain data to frequency domain. One would be motivated because Fourier transform would transform the amplitude as a function of time to amplitude as a function of frequency; to determine the response of a system to complex input signal, the input signal might be broken into sinusoidal elements and the system response to each sinusoidal elements might be analyzed; and fast Fourier transform would perform Fourier transformation on digitized signal over a predetermined sampling period.

7.5 As per claim 19, **Namik, Treiber et al., Visser et al., Remsburg et al., Houghton et al.** and **Fleischhauer et al.** teach the computer system of claim 18. **Namiki** does not expressly teach using a fast Fourier transform to translate time domain data to frequency domain. **Fox** teaches using a fast Fourier transform to translate time domain data to frequency domain (Page 1, Para 0009; Page 2, Para 0016), because Fourier transform transforms the amplitude as a function of time to amplitude as a function of frequency; to determine the response of a system to complex input signal, the input signal may be broken into sinusoidal elements and the system response to each sinusoidal elements may be analyzed (Page 1, Para 0011); and fast Fourier transform performs Fourier transformation on digitized signal over a predetermined sampling period (Page 2, Para 0016). It would have been obvious to one of ordinary skill in the art at the time of Applicants' invention to modify the computer system of **Namiki** with the computer

system of **Fox** that included using a fast Fourier transform to translate time domain data to frequency domain. One would be motivated because Fourier transform would transform the amplitude as a function of time to amplitude as a function of frequency; to determine the response of a system to complex input signal, the input signal might be broken into sinusoidal elements and the system response to each sinusoidal elements might be analyzed; and fast Fourier transform would perform Fourier transformation on digitized signal over a predetermined sampling period.

Response to Arguments

8. Applicants' arguments filed on August 17, 2004 have been fully considered. Applicants' arguments with respect to claim rejections under 35 USC 103 (a) are not persuasive.

8.1 As per the Applicant' argument that "the references do not teach or suggest determining the heat sink fin geometry; determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size; determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars; determining the current density across the heat sink for adjusting the fin geometry", the Examiner respectfully disagrees.

Visser et al. teaches determining the heat sink fin geometry (Page 253, CL2, Para 2; Page 256, CL1, Para 2; Page 256, CL2, Para 2), because the performance of the heat sink depends on a number of parameters (Page 253, CL1, Para 2); heat sinks often take much space

and contribute to the weight and cost of the product (Page 253, CL1, Para 1); and the minimization heat sink mass or thermal resistance requires properly selecting the fin height, fin thickness, the extrusion length, the base thickness and the number of fins (Page 253, CL2, Para 2).

Remsburg et al. teaches determining if the capacitive coupling exists between the heat sink and the central processing unit for adjusting the fin size (CL1, L49-50; CL4, L11-13), because through such capacitive coupling the heat sink acts as an antenna for EMI radiation, thereby amplifying the effects of the radiation (CL1, L50-52).

Houghton et al. teaches determining if inductive coupling exists between the heat sink and the central processing unit for adjusting the number of fins and a number of bars (CL2, L44-50), because inductive coupling causes RF voltage between the heat sink and the IC (CL2, 44-45); and such unintended voltage change may be large and could be interpreted as change in logic state thus resulting in logic failure of nearby electronic device (CL1, L40-43).

Fleischhauer et al. teaches determining the current density across the heat sink for adjusting the fin geometry (CL14, L50-67), because one can increase the thickness of the material of the current path resulting in lower the current density and the ohmic heating (CL14, 60-63); and add an additional heat sink material such as fins to increase the thermal transfer (CL14, L65-67).

8.2 As per the Applicants' argument that "there is simply no basis in the art for combining the references to support a 35 USC 103 rejection, because the references do not teach or even suggest the desirability of the combination", the examiner respectfully disagrees.

The invention that the applicants are claiming was well known in the art at the time of the applicants' invention as shown in the 103 rejections in Paragraph 6 and 7. The applicants' attention is directed to the motivations to combine the references as found in the references themselves and presented in various subparagraphs of Paragraphs 6 and 7 above.

Conclusion

ACTION IS FINAL

9. Applicants' amendments necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Kandasamy Thangavelu whose telephone number is 571-272-3717. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kevin Teska, can be reached on 571-272-3716. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-9600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

K. Thangavelu
Art Unit 2123
November 16, 2004

KEVIN J. TESKA
SUPERVISORY
PATENT EXAMINER